That Which Is Claimed Is:

1. A process for forming a hybrid conversion coating on a ferrous metal substrate, comprising the steps of:

(a) applying to the substrate an intermediate coating rich in molecular iron and oxygen.

(b) contacting the coated substrate of step (a) with an aqueous solution of oxidizing agents to form a surface which is predominantly magnetite, Fe_3O_4.

2. The process of claim 1, wherein in step (a) the substrate is coated with a water insoluble dicarboxylate coating by contacting the substrate with an aqueous solution of a dicarboxylic acid at a concentration, pH, temperature and time to achieve a desired dicarboxylate coating.

3. The process of claim 1, wherein in step (a) the substrate is coated with a water insoluble iron phosphate coating by contacting the substrate with an aqueous solution of a reagent selected from phosphoric acid, pyrophosphoric acid and salts and mixtures thereof, at a concentration, pH, temperature and time to achieve a desired phosphate coating.

4. The process of claim 1, wherein in step (b) the coated substrate from step (a) is contacted with an aqueous solution of an oxidizing agent at a concentration, pH, temperature and time to form a coating of the desired amount of magnetite.

5. The process of claim 2, wherein in step (a), the dicarboxylic acid is selected from oxalic acid, malonic acid, succinic acid, glutaric acid, adipic acid, pimelic acid, maleic acid, malic acid, tartaric acid, citric acid and mixtures thereof.

6. The process of claim 5, wherein the dicarboxylic acid is oxalic acid at a concentration of about 3 - 35 grams per liter, a pH of about 0.5 - 2.5, a temperature of about 50 - 150° F, and a contact time of about 0.5 - 5.0 minutes.

7. The process of claim 4, wherein in step (b) the aqueous oxidizing solution contains oxidizing agents selected from alkali metal hydroxide at concentrations of about 25 - 200 grams per liter, alkali metal nitrate at concentrations of about 9 - 70 grams per liter, and alkali metal nitrite at concentrations of about 1 - 10 grams per liter, a pH of about 13 - 14, a temperature of about 120 - 220° F, and a contact time of about 2 - 10 minutes.

8. The process of claim 1, further comprising the step of sealing the substrate with a topcoat after step (b).

9. The process of step claim 2, wherein in step (a) the substrate is coated in the presence of an additive selected from a grain refiner and an accelerator.

10. The process of claim 9, wherein the grain refiner is alkali metal tartrate at a concentration of about 0.1 - 1.0 gram per liter.

11. The process of claim 9, wherein the accelerator is selected from organic and inorganic nitro compounds, alkali metal salts of citrate, molybdate, polyphosphate, thiocyanate, chlorate and sulfide at concentrations of about 0.5 - 5.0 grams per liter.

12. The process of claim 3, wherein in step (a) the substrate is coated in the presence of an accelerator.

13. The process of claim 12, wherein the accelerator is selected from organic and inorganic nitro compounds at concentrations of about 0.1 - 5.0 grams per liter.

14. The process of claim 1, wherein the coated substrate from step (a) is contacted in step (b) with an aqueous solution of oxidizing agents in the presence of an additive selected from an accelerator, a metal chelator and a surface tension reducer.

15. The process of claim 14, wherein the accelerator is selected from alkali metal salts of molybdate, vanadate, tungstate, thiocyanate, dichromate, stannate, thiosulfate, stannous chloride, and stannic chloride at concentrations of about 0.05 - 0.5 grams per liter.

16. The process of claim 14, wherein the metal chelator is selected from alkali metal salts of thiosulfate, sulfide, ethylene diamine tetraacetate, thiocyanate, gluconate, citrate or tartrate at concentrations of about 1.0 - 10.0 grams per liter.

17. The process of claim 14, wherein the surface tension reducer is selected from alkylnaphthalene sulfonate at concentrations of about 0.025 - 0.2 grains per liter.

18. A ferrous metal article prepared according to any of claims 1 through 17.

19. A coated colored ferrous metal article having a surface formed by two treatments, wherein the first treatment comprises an iron/oxygen-enriched intermediate oxidized coating formed on the ferrous metal article, and the second treatment comprises a further oxidation of the first coating to convert the first coating to a magnetite coating on the ferrous metal article.

20. An oxidation solution for oxidizing at least a portion of an iron/oxygen enriched intermediate coating on a ferrous substrate to magnetite comprising an aqueous solution of oxidizing agents selected from alkali metal compounds of hydroxide, nitrate, and nitrite and mixtures thereof.

21. The oxidation solution of claim 20, and further including an additional component selected from an accelerator, a metal chelator, a surface tension reducer and mixtures thereof.

22. The oxidation solution of claim 20, wherein the oxidizing agents are sodium hydroxide, sodium nitrate and sodium nitrite.

vanadate, chlorate, tungstate, thiocyanate, dichromate, stannate, sulfide and thiosulfate, and stannous chloride and stannic chloride, and mixtures thereof.

24. The oxidation solution of claim 21, wherein the metal chelator is selected from alkali metal compounds of thiosulfate, sulfide, ethylene diamine tetraacetate, thiocyanate, gluconate, citrate, and tartrate and mixtures thereof.

25. The oxidation solution of claim 21, wherein the surface tension reducer is selected from alkylnaphthalene sulfonate and related compounds which are stable in high pH environments.

26. The oxidation solution of claim 25 at a pH range of about 12.0 - 14.0.

27. A process for forming a hybrid conversion coating on a ferrous metal substrate, comprising the steps of:

(1) subjecting the ferrous metal substrate to treatment selected from cleaning, degreasing, descaling, and mixtures thereof;

(2) rinsing the substrate from step (1) with water;

(3) subjecting the substrate from step (2) to a first oxidation to form a molecular iron/oxygen enriched intermediate coating;

(4) rinsing the substrate from step (3) with water;

(5) subjecting the substrate from step (4) to a second oxidation to form a predominantly magnetite, Fe_3O_4 coating;

(6) rinsing the substrate from step (5) with water; and

(7) sealing the substrate with an appropriate topcoat.

28. The process of claim 4, wherein in step (b) the aqueous oxidizing solution is at a temperature of about 70 - 120 F, and a contact time of about 10 to about 30 minutes.